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INTERACTION BETWEEN ISLAND FOXES *(Urocyon littoralis)* AND NATIVE AMERICANS ON ISLANDS OFF THE COAST OF SOUTHERN CALIFORNIA: II. ETHNOGRAPHIC, ARCHAEOLOGICAL, AND HISTORICAL EVIDENCE

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ABSTRACT.—Interactions which existed between Native Americans and island foxes *(Urocyon littoralis)* were examined using data gathered from archaeological, ethnographic, and ethnohistoric sources to ascertain how Native Americans viewed and used foxes and thus why they transported and introduced them to islands off the coast of southern California. Island foxes were harvested for their pelts which were used to make arrow-quivers, capes, blankets, and ceremonial fox dance headdresses. Although foxes were not an important staple in the diet of the inhabitants of the Channel Islands, they were kept as pets or semi-domesticates and did play a prominent role in religious and ceremonial practices. The Island Chumash conducted an Island Fox Dance ceremony and foxes served as totems, dream-helpers, and characters in Chumash legends. Human-fox burial associations and ceremonial fox burials attest to the religious and ceremonial significance afforded foxes by Native Americans. I conclude, based on this data, that island foxes from the Northern Channel Islands were initially transported as pets and subsequently became feral on the Southern Channel Islands.

RESUMEN.—Se examinaron las interacciones que existían entre los indígenas y los zorros isleños *(Urocyon littoralis)*, empleando información recogida de fuentes arqueológicas, etnográficas y etnohistóricas para averiguar cómo percibían y utilizaban los indígenas a los zorros y así entender por qué los transportaron e introdujeron a algunas islas frente a la costa del sur de California. Los zorros isleños eran prendidos por sus pieles, que eran empleadas para elaborar aljabas, capas, cobijas y tocados ceremoniales para la danza del zorro. Aunque los zorros no eran un alimento importante en la dieta de los indígenas de las Islas del Canal, eran criados como mascotás o animales semidomesticados y jugaban un papel prominente en las practicas religiosas y ceremoniales. Los indígenas Chumash de las islas ejecutaban una danza ceremonial del zorro isleño, y los zorros servían de tótems, ayudantes en sueños y protagonistas de las leyendas. Los entierros asociados de humanos y zorros, y los entierros ceremonioles de zorros, asestignan la importancia religiosa y ceremonial que los indígenos le conferían a los zorros. Concluyo, en base a estos datos, que los zorros isleños de las islas del norte del Canal inicialmente fueron transportados como mascotas y posteriormente se asilvestraron en las islas sureñas del Canal.

RESUME.—Les interactions qui existaient entre les indigènes et les renards insulaires *(Urocyon littoralis)* ont été examinées en utilisant des données issues

de sources archéologiques, ethnographiques et ethnohistoriques pour vérifier comment les indigènes percevaient et utilisaient les renards, ainsi que la raison de leur transport et de leur introduction dans les îles de la côte due Sud de la Californie. Les renards insulaires étaient chassés pour leurs peaux, utilisées pour fabriquer des porte-flèches, capes et couvertures, ainsi que des coiffures rituelles lors de la danse qui leur était consacrée. Bien que les renards ne faisaient pas partie de la nourriture de base des indigènes qui habitaient les Iles du Detroit, ils étaient maintenus comme animaux domestiques ou animaux semi-domestiques, et jouaient un rôle proéminent dans les pratiques religieuses et rituelles. Les indigènes Chumash des Iles avaient une cérémonie appelée "la danse des renards insulaires," et les renards servaient de totems, de 'support-de-rêves' et de personnages dans les lègendes des Chumash. Les associations funèbres entre les humains et les renards, et les funérailles rituelles des renards montrent la signification religieuse et rituelle attribuée aux renards par les indigènes. Sur la base de ces données, je conclus que les renards insulaires de Iles du Detroit septentrionales ont été transportés à l'origine comme animaux domestiques et ensuite sont retournés a l'état sauvage dans les Iles du Detroit meridionales.

INTRODUCTION

Skeletal remains of native animals found in archaeological sites have been of interest to archaeologists and zoologists alike. Archaeologists examine faunal remains to (1) make inferences about the dietary habits of a site's former occupants, (2) obtain information about several aspects of Native American subsistence activities such as hunting and butchering techniques, areas of procurement, and details of storage, preservation, and food preparation techniques, and (3) examine settlement patterns, activity areas, seasonal occupation of sites, subsistence adaptations, and aspects of the social organization of a site's former occupants (Martin 1972). Faunal material recovered from archaeological sites can also be used to examine questions not originally envisioned by the archaeologist. Zoologists have used faunal material to clarify the zoogeographic history and taxonomy of particular taxa (Rea 1980; Collins 1982, 1992; Lyman 1983), to demonstrate human-wrought changes in animal populations such as insular extirpations and introductions (Hargrave 1970; Guthrie 1980; Walker 1980; Collins 1982, 1991; Olson 1982; Olson and James 1982a, 1982b, 1984; Simons 1983; Rea 1986), and to reconstruct paleoenvironments (Grayson 1981). By combining information contained in the archaeological record with data from the ethnohistoric and ethnographic literature it should be possible to develop a more thorough understanding of how Native Americans viewed and used particular animals. Simons's (1983) article on the California condor provides an excellent example of just such a study.

The island fox *(Urocyon littoralis)* is presently found on six widely separated islands off the coast of southern California (Hall 1981). Morphological variation and taxonomic affinities with its purported mainland ancestor, the gray fox *(U. cinereoargenteus),* have been assessed by Collins (1982, 1992). In a recent paper I examined the role which Native Americans played in establishing island foxes on some of the islands where they presently occur and discussed probable historical colonization sequences for each island population (Collins 1991). The

morphological variation in present-day and archaeological samples, coupled with an examination of island fox remains from Channel Island archaeological sites, revealed that Native Americans were responsible for introducing island foxes from the Northern Channel Islands to the Southern Channel Islands (Collins 1991). Based on archaeological data I determined that island foxes were present on the Northern Channel Islands prior to the arrival of human populations 9000–10,000 years ago but did not appear on the Southern Channel Islands until much later (about 2200 years ago on San Nicolas Island, 3400–3800 years ago on San Clemente Island, and sometime between 800 and 3400 years ago on Santa Catalina Island) (Collins 1991). The occurrence of island fox remains in direct association with human remains on Santa Rosa and Santa Cruz Islands led me to conclude that foxes on these two islands were given special mortuary treatment because they were assigned religious or ceremonial value. I also found a number of island fox burials on San Clemente Island which were probably associated with canid killing or mourning ceremonies (Collins 1991).

While the morphological variation, evolutionary relationships, and archaeological record of island foxes have been thoroughly examined (Collins 1982, 1991, 1992), questions still persist. Why would Native Americans want to transport and introduce island foxes? Could the archaeological and ethnographic record shed light upon prehistoric interactions between humans and island foxes? Were island foxes kept as pets or utilized in human subsistence activities? What cultural and/or religious significance did Native Americans assign island foxes?

Information in the archaeological, ethnographic, and historic records regarding interactions between Native Americans and island foxes has not been fully evaluated. Therefore, the primary objective of this paper is to document through the use of these records any prehistoric interactions between humans and island foxes that might indicate why Native Americans influenced the zoogeography of the island fox.

METHODS

To evaluate prehistoric interactions between Native Americans and island foxes, I have assembled data from the archaeological record and from historic and ethnographic literature. Archaeological manifestations of island foxes included unmodified remains, intentional fox burials, and artifacts fashioned from hides. Faunal material from Channel Island archaeological sites was examined for island fox bone. I recorded the type and quantity of fox bone found at each site and noted the provenience of each occurrence (Collins 1991). In addition, I examined each bone for evidence of possible cultural modifications such as butchering, burning, unusual breakage, and/or manufacturing marks, to determine whether a bone was derived from cultural or natural depositional processes. Archaeological occurrences of unmodified remains and intentional fox burials are discussed in an earlier paper (Collins 1991).

Historic and ethnographic literature for tribes in central and southern California was examined to determine the role of foxes in indigenous cultures. In particular I looked for information relative to foxes being used as a source of food and/or pelts, for manufacture of artifacts, as pets or semidomesticates, and in

religious and/or ceremonial functions. This literature review primarily focused on the Chumash and Gabrielino Indian tribes that inhabited the Channel Islands region (Fig. 1).

There are a number of questions which need to be discussed in considering the role which Native Americans played in determining the present far-flung distribution of the island fox. First, what tribes were present on the islands? Second, how long have humans been present on each of the islands and therefore potentially capable of influencing the distribution of island foxes? Third, were there established trade routes between the islands which could have served as routes for the transport of island foxes? Fourth, what cultural factors influenced people to transport island foxes? Were they kept as pets, or as an alternative source of food or pelts? Were they afforded any special religious or ceremonial significance?

In the following discussion, archaeological, historic, and ethnographic data are used to shed light upon prehistoric interactions between Native Americans and island foxes and to suggest why Native Americans assisted in the dispersal of island foxes.

THE PEOPLE

Based on studies of human osteology, Titus (1987) argues that the islands off the coast of southern California were inhabited over time by two distinct groups

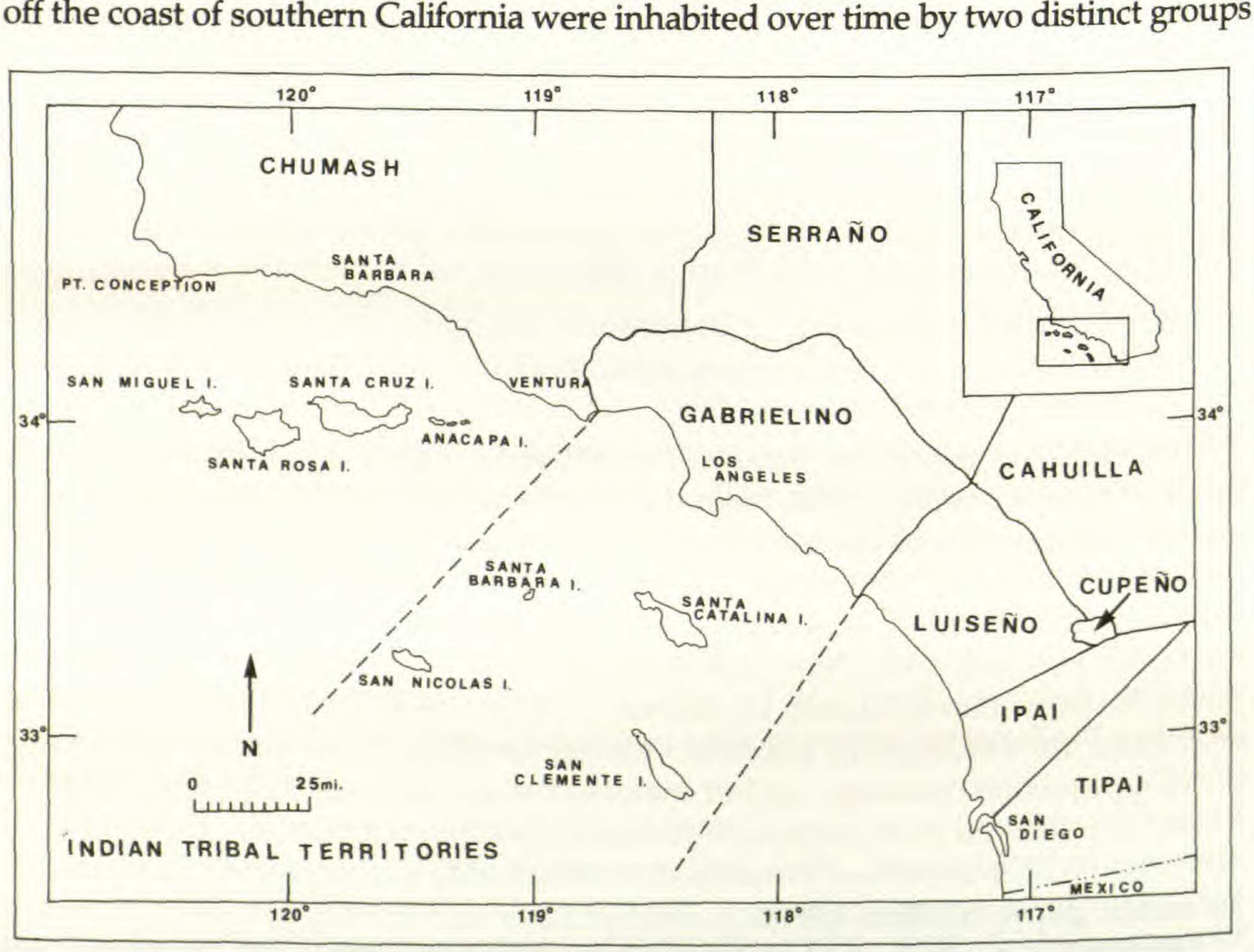

FIG. 1.—Map of the generalized distribution of tribal territories in southern California. This is a composite map which is based on maps contained in Hudson and Blackburn (1985), Salls (1988), and Salls and Hale (1991).

of people. During the Early Period (7500 to 3500 B.P.), all of the islands were inhabited by a single group of people from a "round-headed" genetic population, possibly representing an earlier Hokan stock (Titus 1987). By 1500 B.P., Titus (1987) found that this "round-headed" stock was replaced on San Clemente Island by a new "long-headed" genetic population assumed to represent a Uto-Aztecan intrusion. Titus (1987) suggests that these "long-headed" people were probably ancestors of the Gabrielino Indians that inhabited the Los Angeles Basin and the Southern Channel Islands during the last two to three millenia.

Since the Middle Period (3500 to 800 B.P.), the islands off the coast of southern California were inhabited by tribes belonging to two distinct language stocks. The Northern Channel Islands (San Miguel, Santa Rosa, and Santa Cruz) were in Chumash territory (Fig. 1; Grant 1978; Johnson 1988a) and were associated with the Hokan linguistic stock (Shipley 1978). The Southern Channel Islands (Santa Barbara, San Nicolas, Santa Catalina, and San Clemente) were in Gabrielino territory (Fig. 1; Bean and Smith 1978; Johnson 1988b) and were associated with the Takic family of the Uto-Aztecan linguistic stock (Shipley 1978). While it is known that Santa Catalina and San Clemente Islands were inhabited by Gabrielino Indians (Kroeber 1925; Bean and Smith 1978; Johnson 1988b), the tribal affinities of Indians on San Nicolas Island have not been firmly established as their populations had been depleted before ethnographers could record any substantive information (Salls and Hale 1991). The inhabitants of San Nicolas Island apparently spoke a unique dialect (Kroeber 1907) which probably was affiliated with the Takic family of the Uto-Aztecan linguistic stock (Shipley 1978). Thus, based on linguistic evidence, it is probable that San Nicolas Island was inhabited by people of Gabrielino descent.

Although the Northern and Southern Channel Islands were inhabited during the Middle and Late Periods (800 to 120 B.P.) by tribes from different language stocks, their material cultures have appeared similar to some archaeologists who have referred to archaeological remains from both areas as "Canalino" (Salls 1988). Trade between these two island groups was frequent throughout their occupation (King 1976, 1982). The recovery of island fox skeletal remains at the Eel Point Site (SCII-43C) below a level that was radiocarbon dated at 3400 B.P. (Collins 1991), coupled with the fact that "round-headed" people (i.e., pre-Hokan stock) were present on San Clemente Island around 3000 B.P. (Titus 1987), suggests that foxes were probably first transported to San Clemente Island by peoples belonging to an earlier Hokan stock. Thus, island foxes were present on the Southern Channel Islands prior to the arrival of populations of Uto-Aztecan stock.

History of Native American Occupation of the Southern California Islands.—There is still controversy about when humans first arrived in coastal California and thus when each of the Channel Islands were first inhabited. Some authors (Berger and Orr 1966; Orr and Berger 1966; Orr 1968; Bryan 1978; Davis 1978) have suggested that humans may have reached the New World as early as 30,000 to 40,000 B.P. However, most of the evidence used to support a late Pleistocene colonization of the New World is either of unsubstantiated cultural origin, or is circumstantial or unclear (Glassow 1980). Although human presence prior to the end of the

Pleistocene continues to be debated, today the majority of archaeologists agree that widespread occupation of North America did not occur until about 11,500 years ago (Haynes 1976). It can be assumed that humans came to California shortly after their initial arrival in North America.

Reliable radiocarbon dates associated with human occupation suggest a terminal Pleistocene occupation of the Channel Islands at about 9000 to 10,000 B.P. The earliest currently accepted date obtained so far for human activity on the Northern Channel Islands is an uncorrected radiocarbon date of 10,260 ± 90 years B.P. obtained from the Daisy Cave site (SMI-261) on San Miguel Island (Snethkamp 1986). Early radiocarbon dates on Santa Rosa Island have been obtained at Arlington Springs (SRI-173)—10,080 ± 810 years B.P.—and at Lobo Canyon (SRI-116)—7650 ± 580 years B.P.—(Berger and Protsch 1989). A human burial at Lobo Canyon (SRI-116) was dated at more than 8700 years B.P. (Morris 1987). The earliest accepted dated occurrence for humans on Santa Cruz Island comes from a corrected radiocarbon date of 7500 years B.P. obtained at the Punta Arena site (SCrI-109; Erlandson 1988). Thus, the Northern Channel Islands were inhabited by Native Americans by 9000 to 10,000 years ago.

During the last decade several radiocarbon dates have established human occupation of the Southern Channel Islands by about 9700 years ago (Salls 1988). On San Clemente Island the earliest charcoal-based radiocarbon dates ranged from 9775 ± 165 to 9870 ± 770 years B.P. for SClI-43B (Erlandson 1988). The earliest radiocarbon date for human occupation on San Nicolas Island, obtained from a midden at SNI-339, is 8215 ± 85 years B.P. (reservoir-adjusted to be 8000 years B.P.) (Salls 1988). Further archaeological research on Santa Catalina Island is needed to determine whether this island was inhabited as early as the other Southern Channel Islands.

Thus, there is reasonably accurate evidence to suggest that humans have been present on islands off the coast of southern California for at least the last 8000 to 9000 years and possibly as long as 10,000 years. Therefore, they could have been influencing the distribution of island foxes in this region at least since the end of the Pleistocene.

Native American trade routes.—There is abundant evidence establishing the existence of trade in resources and manufactured goods, both between islands and mainland, and among the islands (King 1976; Hudson 1976; Tartaglia 1976; Hudson et al. 1978). Ethnohistoric accounts describe Chumash canoe trips between the Northern Channel Islands and the adjacent mainland and between islands (Hudson et al. 1978). The mainland Chumash traded roots, seeds, acorns, milkweed fiber, furs, skins, shawls of fox skin, blankets, deer, bows, and arrows to their island counterparts in return for shell, "coral," and fish bone beads, abalone shell, fish, marine mammal meat, sea otter pelts, and other items (King 1976; Hudson 1976; Tartaglia 1976; Hudson et al. 1978).

Other evidence of mainland-to-island and island-to-island trade can be found in the distribution of goods manufactured on the islands, such as objects made of steatite (soapstone), and shell. Many of the steatite bowls, *ollas,* and *comals* found throughout southern California appear to have originated from Gabrielino

quarries on Santa Catalina Island (Heizer and Treganza 1944; Meighan and Johnson 1957; Meighan 1959; Wlodarski 1979). Steatite artifacts have also been reported from most of the Channel Islands including San Clemente (McKusick and Warren 1959), San Nicolas (Bowers 1890; Bryan 1930, 1970), Santa Cruz (Rogers 1929), and Santa Rosa Islands (Orr 1968). Mainland sites situated along the coastal zone throughout southern California have also produced many examples of steatite artifacts (Meighan and Rootenberg 1957; Finnerty et al. 1970). Shell bead money was also a significant item of trade (King 1991). Island Chumash specialized in the manufacture of shell bead money and shell ornaments (King 1976, 1982). These objects were widely distributed throughout southern California, reaching as far east as sites in Arizona (Glassow 1980).

The exact dates when intensive trade of manufactured goods for natural resources began have not yet been firmly established. Several authors have suggested that manufacturing was frequently engaged in by islanders after A.D. 1000 (Meighan and Rootenberg 1957; Meighan 1959; Wlodarski 1979; Glassow 1980; King 1991), but trade of manufactured goods and natural resources did occur earlier with less intensity (King 1982). Although quarrying, manufacturing, and exchange of soapstone objects from Santa Catalina Island began more than 4000 years ago, large-scale production and exchange of this island-manufactured resource was restricted to the last 500 to 700 years (Wlodarski 1979). Since island fox bone first appears in the archaeological record on San Clemente Island around 3400 B.P., and on San Nicolas Island around 2200 B.P. (Collins 1991), island foxes were probably transported to the Southern Channel Islands prior to the period of intensive inter-island trade of manufactured goods.

In summary, the presence of island-manufactured shell bead money and quarried steatite in mainland and island sites, mainland quarried serpentine bead blanks in early Santa Cruz Island sites, obsidian in early contexts on all the islands, and non-native mammal bone (i.e., mule deer and domestic dog) in island archaeological contexts, firmly establishes the existence of trade both among the islands and between the islands and the mainland (King 1982). Santa Cruz, Santa Catalina, and San Clemente Islands each had established trade routes with the adjacent mainland (Davis 1961). Trade routes also existed between Santa Cruz and Santa Catalina Islands, and between islands within each of the island groups (Davis 1961). Thus, it is possible that people could have transported foxes to some of the offshore islands. Moreover, since trade occurred between the Northern and Southern Channel Islands, a possible route of introduction may well have followed this direction (i.e., Santa Cruz to Santa Catalina or San Clemente Island and then to San Nicolas Island).

ARCHAEOLOGICAL RECORDS OF ISLAND FOXES IN PREHISTORIC SITES ON THE CHANNEL ISLANDS

In a previous paper, I provide a detailed record of the archaeological occurrence of island foxes (Collins 1991). A brief summary of these results is warranted here.

Archaeological manifestations of island foxes included unmodified remains and intentional burials. Island foxes were found in 27 archaeological sites and

one fossil locality on the six largest islands off the coast of southern California. Unmodified fox remains were present in sites which ranged in age from 7500 B.P. (Santa Cruz and Santa Rosa Islands) to historic times (all six islands). On the Southern Channel Islands, foxes first appear in the archaeological record about 3400 to 3800 B.P. on San Clemente Island, 800 to 3400 B.P. on Santa Catalina Island and 2200 B.P. on San Nicolas Island (Collins 1991). Island fox bone has yet to be recorded from any Early Period sites on the Southern Channel Islands. Foxes were found throughout human occupation on Santa Cruz and Santa Rosa islands and were present beginning in Middle through Late Period sites on San Miguel Island. A fossil island fox skull recovered from a geological formation on Santa Rosa Island dating between 10,400 and 16,000 years suggests that foxes were present on that island prior to the arrival of Native Americans 9000 to 10,000 years ago.

Remains of 51 island foxes that appear to have been intentionally buried were found at 12 sites on four of the Channel Islands (Table 1). Foxes were found in direct association with human remains on Santa Cruz Island, and possibly in direct association with human remains in cemeteries on Santa Rosa Island (Table 1; Collins 1991). Burials of foxes not in association with human remains were found on Santa Cruz, San Nicolas, and San Clemente Islands. Of 10 fox burials found on San Clemente Island, seven were pups and three were associated with grave goods. Nine of the 10 fox burials contained solitary foxes that were folded head to tail and each stuffed vertically, dorsal surface down, into individual grave pits (Fig. 2; Salls and Hale 1991). There appear to be differences in fox burial patterns between the Northern and Southern Channel Islands, the possible reasons for which are discussed later in this paper.

The use of foxes in human subsistence activities.—One of the interaction patterns between island foxes and Native Americans was the use of foxes in human subsistence activities. Foxes could have been harvested for food or pelts, or kept as pets or semidomesticates.

The use of foxes as a source of food. Nine tribes in central and northern California were known to eat gray foxes (Driver 1937; Voegelin 1942). In southern California, the mainland and island Gabrielino and Chumash, Kitanemuk, Serraño, and Colorado River Yumans occasionally ate foxes (Harrington 1942; Landberg 1965; Martin 1972; Rea 1981). Six tribes in northern California, one in central California (Tubatulabal), and one in southern California (Luiseño) refrained from eating gray fox (Drucker 1937; Voegelin 1938, 1942). Thus, ethnographic sources indicate that foxes were not an important food source for most California peoples.

The virtual absence of fox bones from archaeological sites throughout California also suggests that foxes were not a staple in the diet of any California Indian tribe (Collins 1982). Gray fox remains are scarce in mainland Gabrielino and Chumash sites. Gabrielino sites which have recorded gray fox include Ora-193 (Langenwalter 1981), Big Tujunga LAn-167 (Martin 1972; Langenwalter 1978), and Mulholland LAn-246 (Galdikas-Brindamour 1970). An unnamed site north of Agoura (Ven-39) is the only mainland Chumash site in which gray fox have

TABLE 1.—Island fox burials with ritual or ceremonial connotations.

Island[1]	Site No.[2]	Provenience	Material Present	Age	Type of Association
SRI	1	Cemetery A, Burial 1	4 complete skulls	Ads.	Human cemetery
SRI	2A	Cemetery A, Burial 4, Level 2	5 partial skulls	Ads.	Human cemetery
SRI	2A	Cemetery A, Plot C-2	1 complete skeleton	Ad.	Human cemetery
SRI	2B	Cemetery B, Trench B	3 partial skulls	Ads.	Human cemetery
SRI	41	Cemetery C, Section II	1 skull	Ad.	Human cemetery
SCrI	3		1 complete skeleton	Ad.	Human cemetery
SCrI	8	Pit DD-1, 3′	1 skull	Ad.	Human burial
SCrI	100	Pit D-5	2 skulls	Ads.	Human burial
SCrI	131	Pit 4, 3′-5′ 2″	2 skulls	Ads.	Human burial
SCrI	?		1 skull	Ad.	Ritual burial with grave goods
SNI	7		20 complete/partial skeletons	Ads.	Ritual burial?
SClI	43C	Unit 4, 160-175cm, Feature D	2 complete skeletons	Pups	Ritual burial with beads
SClI	43C	Unit 6, 175-190cm, Feature O	1 partial skeleton	Ad.	Ritual burial
SClI	1215	Unit 4-5, W10, 50-60cm	1 partial skeleton	Ad.	Ritual burial?
SClI	1524	Unit 7S/15E, 20-30cm, Feature F6	1 skeleton	Pup	Ritual burial with grave goods
SClI	1524	Unit 7S/17E, 10-20cm, Feature 125	1 skeleton	Ad.	Ritual burial
SClI	1524	Unit 8S/17E, 15-18cm, Feature 96	1 skeleton	Pup	Ritual burial
SClI	1524	Unit 13S/15E, 30-40cm, Feature 48	1 skeleton	Pup	Ritual burial with grave goods
SClI	1524	Unit 13S/19E, 30-40cm, Feature 140	1 skeleton	Pup	Ritual burial
SClI	1524	Unit 17S/OW, 15-30cm, Feature 109	1 skeleton	Pup	Ritual burial

1. Locality acronyms are as follows: SRI = Santa Rosa Island; SCrI = Santa Cruz Island; SNI = San Nicolas Island; SClI = San Clemente Island.

2. University of California-Berkeley (UCB) site numbers are used for Santa Cruz Island while University of California-Los Angeles (UCLA) site numbers are used for the rest of the islands. For site concordance of the Santa Cruz and Santa Rosa Island sites with other numbering systems see Glassow (1977).

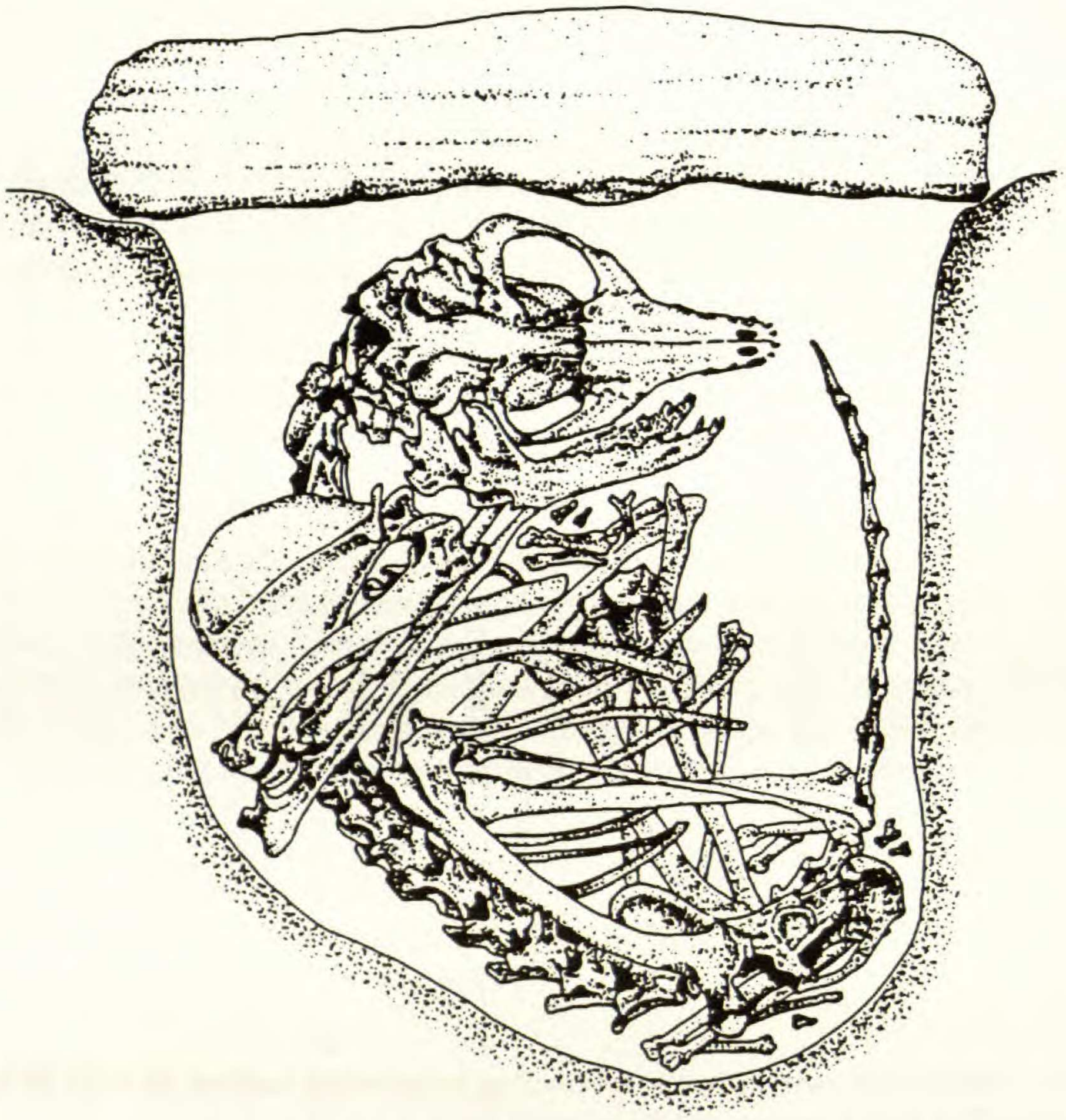

FIG. 2.—Typical example of the folded head to tail orientations observed in ritual island fox burials recovered from the Lemon Tank Site on San Clemente Island (SCII-1542) (From Salls and Hale 1991, by permission).

been recorded (Martin 1972). Unmodified fox remains were rare at these sites (one to three specimens at each). The scant archaeological evidence of foxes in mainland sites suggests that there was a cultural preference not to eat fox regularly. In general, analysis of faunal remains from Chumash and Gabrielino sites indicates that all of the coastal and island peoples tended to utilize marine animals such as fish, shellfish, and marine mammals extensively, while land animals were of lesser importance (Landberg 1965; Glassow 1980).

Island foxes have not yet been recovered from any mainland archaeological sites in southern California. Remains of island foxes are far more abundant in Channel Island archaeological sites than gray foxes are in mainland sites (Collins 1991). A combination of factors is probably responsible for this situation. Island fox populations exhibit higher population densities than mainland gray fox populations (Laughrin 1980), are more diurnally active (Fausett 1982), and show a general lack of fear of humans (Laughrin 1977). These factors, probably the result of

reduced competition and absence of predators (Laughrin 1977), would tend to make foxes on the islands more readily available to humans as an emergency source of food or as a dependable source of pelts.

If foxes were regularly eaten, then their skeletal remains should show cultural modifications consistent with this type of use. Limb elements should have been broken for the extraction of marrow, skulls should have been broken for the removal of brains, and there should have been a significant number of burned or calcined bones. Examination of archaeologically-recovered island fox bones for butcher marks, fragmentation of long bones, and charring, however, revealed little evidence that foxes were being harvested as a food source or that their bones were being used for manufacturing artifacts. The only evidence of cultural modifications on island fox bones found during this study was one burned ulna recovered from San Miguel Island by Walker and Snethkamp (1984) and butcher marks on five skulls recovered from San Nicolas, Santa Rosa, and Santa Cruz Islands (Collins 1982). The charred ulna does not confirm that a fox was consumed by the inhabitants but might suggest that a fox bone was accidentally burned in a fire. The locations of the butcher marks suggest that people were skinning foxes for their pelts, as discussed in the next section. From the archaeological record it seems reasonable to conclude that island foxes were rarely if ever eaten by Native Americans on the Channel Islands and as such were probably not transported to the southern islands to serve as an alternative source of food. Nonetheless, the abundance of island fox remains in archaeological contexts suggest that island inhabitants may have placed special value on foxes either as a source of pelts, as pets, or for use in religious and ceremonial practices.

Use of foxes as a source of pelts. Ethnographic and historic accounts from several California Indian tribes mention that gray foxes were hunted for their pelts, which were used to make arrow quivers, capes, blankets, and portions of costumes. Tribes which made arrow quivers from gray fox pelts included Hupa (Beals and Hester 1974), Sierra Miwok (Barrett and Gifford 1933), southern California Luiseno (Drucker 1937), Chumash (Harrington 1942), Kitanemuk (Hudson and Blackburn 1982), and Gabrielino (Harrington 1942; Heizer 1970). There is no information about Island Chumash arrow quivers, but since they were known to use arrows the islanders may have used island fox skins to construct quivers (Hudson and Blackburn 1982).

Mainland Chumash were known to value "shawls" (Spanish: *tapalos)* made of fox skins which they exchanged with island Chumash for fish and beadwork (King 1976). Harrington recorded extensive ethnographic data concerning Chumash, Kitanemuk, and Gabrielino use of fox skins for making sewn and woven capes and blankets (Hudson and Blackburn 1983, 1985). According to Fernando Librado, one of Harrington's consultants, the Santa Cruz Island Chumash "preferred to wear a fox skin blanket as big as a bed quilt to other ones. It would take many skins, cut into strips three inches wide and sewn together, to make such a blanket" (Hudson and Blackburn 1983:385). Early explorers have described hide capes, cloaks, and robes made of animal fur which were worn by coastal Chumash. Longinos Martínez reported in 1792 that "from the waist

up they [the women] wear [a garment] of fox, otter, squirrel, or rabbit fur oblong in shape and very comfortable'' (Simpson 1961:53). In 1792, Menzies wrote that the men ''put on a kind of garment made of fox or raccoon skins with the fur side out'' (Eastwood 1924:315, 324). Thus, the Chumash either sewed fox hides together edge to edge or cut them into strips which they twisted or wove together to make capes and/or blankets. To make a single blanket or a large cape would require many island fox skins. This might explain the occurrence of 20 island fox skeletons recovered by Orr during one morning of excavation at a site (SNI–7) on San Nicolas Island (Table 1; Orr 1945).

Mainland and Island Chumash also used fox skins in ceremonies, particularly in the form of a headdress worn by dancers performing the Fox Dance (Hudson and Blackburn 1985). These headdresses were constructed of a woven frame covered by fox skin or some other animal skin. Some ''had a real fox head sticking out in front of the headdress'' (Hudson and Blackburn 1985:195). Island fox pelts were probably used by Island Chumash to adorn their Fox Dance headdresses. Although the Fox Dance was primarily associated with the Island Chumash, it was also performed at *fiestas* held at mainland Chumash villages (Hudson and Blackburn 1985).

If the entire fox skin was being removed intact, butcher marks would probably have been left on bones near the anterior portion of the rostrum, since this is an area of the body where the skin adheres to the bone. However, if the head and legs were cut off the carcass prior to skinning as among the Central Miwok (Barrett and Gifford 1933) and Tarahumar (Pennington 1969), then butcher marks should appear on the posterior margin of the skull, the occipital condyles, the cervical vertebrae, or the distal ends of the long bones. All butcher marks found on island fox bones recovered from Channel Island archaeological sites occurred across the anterior portion of the rostrum and mandible. This suggests that Chumash and Gabrielino Indians were skinning island foxes whole for their pelts. The absence of butcher marks from other island fox skeletal elements either suggests that foxes were not being butchered for use as food or indicates the ability to skin foxes without cutting into the bone.

In summary, ethnographic and historic literature and archaeological data suggest that Chumash and Gabrielino Indians hunted gray fox and island fox for their skins and that these skins were used to manufacture arrow quivers, capes, blankets, and ceremonial fox dance headdresses. Island foxes could have been taken to the Southern Channel Islands to provide the island inhabitants with a source of foxes to be used for making these items. Although there is no evidence that Gabrielino Indians on the Southern Channel Islands performed the Fox Dance, if they did then island fox pelts would have been necessary to construct the headdresses used. Alternatively, Chumash islanders may have traded already prepared headdresses or unprocessed fox pelts for soapstone or other needed raw materials rather than transport and trade live foxes.

Use of foxes as pets or semidomesticates. Island foxes are characterized by fearless and inquisitive behavior, high population densities, and diurnal activity patterns. These factors would have made them readily accessible for possible

domestication and transport. Since the island fox is easily tamed, it could make an excellent pet (Wenner & Johnson 1980). Indeed, "with a little coaxing the fox becomes sociable and one often wonders how this animal had survived through heavy Indian habitation if they were not friendly toward it" (Smith 1977:41).

Dogs were the only animals known to have been regularly kept as pets by California Indians (Kroeber 1941). Occasionally, bears, condors, eagles, hawks, and ravens may also have been kept as pets by California tribes including the Chumash. There are no ethnographic or ethnohistoric accounts documenting that Chumash or Gabrielino Indians kept foxes as pets. Island fox burials found with humans on Santa Cruz Island and in human cemeteries on Santa Rosa Island (Table 1) suggest two possible explanations: (1) that island foxes may have been kept as pets and were given special burial considerations upon their death or the death of their masters, or (2) that foxes may have been associated with special ceremonies or rituals and as such were given special burial considerations. To determine whether island fox burials are the result of animals kept as pets, or are the result of religious or ceremonial practices, ethnographic and archaeological data were gathered on how California Indians used and disposed of their pet dogs.

Ethnographic data concerning the possible uses of dogs by the Chumash and Gabrielino is limited, though both groups kept them as pets and were known to eat them occasionally (Kroeber 1925, 1941; Harrington 1942). For the Gabrielino, dogs "were valued animals and are believed to have been most likely buried like humans as a method of working out grief resulting from the dissolution of the owner–pet bond at death, rather than for religious or ceremonial purposes" (Langenwalter 1986:65). Dogs could also have been buried for supernatural reasons, such as to help guide the deceased in their journey to the Land of the Dead. According to Bean and Smith (1978) the Island Gabrielino had a custom of burying a dog over the deceased person's body. However, there is no archaeological evidence to confirm this practice nor to confirm that the Chumash or Gabrielino actually practiced pet killings and interment of pets with their masters (King 1969). This practice has been recorded for a number of other California tribes including the Miwok (Aginsky 1943), Yokuts (Driver 1937), and Nisenan (Beals 1933).

Domestic dog remains have been found in archaeological sites throughout southern California and on the Channel Islands, evidence that Native Americans kept dogs as pets and transported them in watercraft (Schumacher 1877; Bowers 1890; Rogers 1929). While dog burials are a relatively common occurrence among the Chumash and Gabrielino (Johnston 1962; Landberg 1965; Langenwalter 1978, 1986; Salls and Hale 1991), their burial in direct context with humans or with burial goods is much less common (Rogers 1929; Titus 1984; Langenwalter 1985, 1986; Reynolds 1985). On San Nicolas Island, dog burials have been found in several human cemeteries, but none were in direct association with human remains, nor was there any evidence of violence to suggest that they might have been sacrificial burials (Orr 1945; Orr and Rett 1945).

Several dog burials from the Channel Islands do suggest rituals related to religious practices. A ceremonial burial of a dog which had been wrapped in sea otter skin was found in Big Dog Cave on San Clemente Island (McKusick and

Warren 1959). A number of dog burials, several of them adorned with grave goods, were recovered in 1983 from San Clemente Island at the Eel Point site (SClI-43) (Titus 1984) and in 1988 and 1989 at the Lemon Tank site (SC1I-1524); these could be related to a canid killing ceremony possibly associated with Chingichngish religious practices such as mourning or burial ceremonies (Salls and Hale 1991).

It appears from the ethnographic and archaeological record that Chumash and Gabrielino Indians generally buried their pets but that they only occasionally buried them with artifacts or in direct association with human burials. If island foxes were being kept as pets on some of the islands, then I would expect to find their remains in contexts similar to those recorded for dog burials. Indeed, a number of the fox burials recovered from human cemeteries on the Channel Islands are suggestive of foxes being kept as pets. However, the occurrence of island fox remains in direct association with human burials on Santa Cruz and Santa Rosa Islands and with artifacts on San Clemente Island is probably best explained by island foxes having special religious or ceremonial value, as will be discussed below.

The use of foxes in religious and ceremonial systems.—Another pattern of interaction between island foxes and humans was based upon religious and ceremonial practices. The ethnographic literature for California tribes is particularly rich with descriptions of ceremonial observances and treatments accorded animals (Lillard et al. 1939; Heizer and Hewes 1940; Cowan et al. 1976; Langenwalter 1986). Archaeological occurrences of intentional animal burials as well as artifacts fabricated from animal parts help document special attitudes toward animals. By examining how the Chumash and Gabrielino viewed animals it may be possible to understand and interpret unusual archaeological occurrences of island foxes. Several possibilities could account for the occurrence of unusual island fox burials. Island foxes could have been revered as totemic animals and thus been kept as pets by totemic clans. Alternatively, foxes could have been spirit guides to individuals, and as such, body parts of foxes were kept as talismans. Either of these alternatives could account for unusual archaeological occurrences of island foxes or for the presence of island fox remains in direct association with human remains.

Overview of California ritual animal burials. Animal burials suggest the presence of ceremonial activities associated with a particular species. By comparing the archaeological record with ethnographic descriptions of religious and social customs, it is often possible to infer that ceremonial activities were associated with a species. Such analyses also provide a clearer picture of how a native society viewed that species. Burials in which the entire or partial skeleton of an animal is found, either in a cemetery or in direct association with human burials or artifacts, are probably affiliated with rituals or ceremonies.

There are many documented occurrences of ceremonial animal burials (Lillard et al. 1939; Heizer and Hews 1940; Wallace and Lathrop 1959; Gerow and Force 1968; Langenwalter 1986; Salls and Hale 1991). Animals known to have been buried in a ceremonial context include bear, badger, coyote, beaver, deer, dog, and various birds of prey. Some of these may represent an individual human being buried with his hunting trophies, charms, pets, or other personal belong-

ings as part of a mortuary ceremony (Gerow and Force 1968). Many California tribes buried the dead with their personal belongings and with offerings of food and clothing (Kroeber 1925). The Chumash (Landberg 1965) and Gabrielino Indians (Johnston 1962) apparently practiced this custom.

Animal burials, particularly dog burials, were common among the Chumash and Gabrielino. Along the mainland coast ritual animal burials have been recovered from two sites in Chumash territory and from six sites in Gabrielino territory (Langenwalter 1986). A ceremonial eagle burial was recovered from a Chumash site at Point Sal in Santa Barbara County (Carter 1941). A dog burial from a Ventureño Chumash site may represent the burial of a pet (Langenwalter 1978). Thirteen animal interments (one red-tailed hawk and 12 dogs) were recovered from a Gabrielino site (LAn-43) (Langenwalter 1986). There have been no gray fox burials recorded among any California Indian tribes. Thus, based on archaeological and ethnographic records, it does not appear that gray foxes were afforded any special religious or ceremonial status by mainland tribes.

As discussed above, animal burials, particularly dog burials, are relatively common on the Channel Islands. Several articulated bird skeletons were recovered from a site on Santa Cruz Island (Hoover 1971). The ceremonial burial of a dog and two chickens was found in Big Dog Cave on San Clemente Island (McKusick and Warren 1959) and recent excavations on the same island have recovered a number of additional ritual animal burials. Three island fox burials were recovered from the Eel Point Site (SCII-43C) (Titus 1984; Bleitz-Sanburg 1987) while 20 animals burials (7 island fox, 5 dogs, 8 birds) have recently been recovered from the Lemon Tank Site (SCII-1524) (Salls and Hale 1991). To date there have been a total of 51 island fox burials recovered from the Channel Islands (Table 1). At least 31 of these are suggestive of some sort of ceremonial or religious value assigned island foxes.

Ceremonies associated with foxes. Fox ceremonies were not very common among Native Americans. On the Plains, Cheyenne practiced a fox ceremony (Grinnell 1962) while the Pawnee had a Fox Society (Dorsey 1904). In California, the Maidu occasionally used stuffed fox skins as images of the deceased in burning ceremonies (Hill 1972). The fox appears as a character in two Chumash legends, suggesting that foxes played some role in Chumash society (Blackburn 1975). The Island Chumash practiced a Fox Dance which was also performed at *fiestas* on the mainland (Hudson et al. 1977). This dance was apparently associated with island foxes since its songs were sung in Cruzeño, the language of the Chumash on the Channel Islands. Fox burials on Santa Rosa and Santa Cruz Islands are indicative of some ceremonial value assigned island foxes (Collins 1991).

It is unknown whether the Gabrielino had any ceremonies associated with foxes; there are no extant accounts of the Gabrielino practicing a fox dance or having the fox as a prominent character in any legends. Although the ethnographic literature is silent regarding canid ceremonialism on the Southern Channel Islands, archaeological records of intentional fox burials on San Clemente Island (Table 1) suggest the existence of a canid killing or mourning ceremony possibly affiliated

with Toloache rituals and/or Chingichngish religious practices such as adolescent initiation rites, mourning, or eagle-killing ceremonies (Salls and Hale 1991).

The role of foxes in religious systems. Groups who inhabited southern California and the Channel Islands practiced the Toloache religious-ceremonial system (Bean and Vane 1978) which utilized the hallucenogenic plant, jimson weed, *Datura* sp., to help in the "acquisition of supernatural power from sources accessible only during altered states of consciousness" (Simons 1983:480). Several major religious subsystems developed out of the Toloache religious-ceremonial system within southern California: (1) the "Northern Complex" among the Southern Valley Yokuts, Kitanemuk, Tataviam, and Gabrielino peoples, (2) the ***'Antap-Yivar*** religious complex among the Chumash, Gabrielino, and Tataviam peoples, (3) the "Southern Complex" among the Gabrielino and Luiseño-Juaneño peoples, and (4) the Chingichngish religion among Gabrielino, Luiseño-Juaneño, Cupeño, and Ipai-Tipal peoples (Bean and Vane 1978; Hudson and Blackburn 1978; Simons 1983). The Island Chumash belonged to the ***'antap-yivar*** mythic-ritual complex while the Island Gabrielino on San Nicolas, Santa Catalina, and San Clemente Islands may have belonged to several mythic-ritual complexes including the ***'antap-yivar,*** Southern, and Chingichngish religious complexes (Hudson and Blackburn 1978). Each of these religious subsystems was "characterized by elaborately developed tenets, replete with symbolic meanings, and a complex pantheon of supernatural deities and beings. A highly detailed system of ceremonies was overseen by a professional priesthood" (Simons 1983:481).

Examination of these religious-social systems helps in interpreting the occurrence of unusual animal/human burial associations. A number of tribes occupying central and southern California (i.e., Miwok, Mono, Central Yokuts, Salinan, Kitanemuk, Serraño, Cahuilla, Cupeño, Luiseño, Yuma, and Mohave) were known to have had totemic moieties (Gifford 1916; Kroeber 1925; Driver 1937; Gayton 1948; Bean 1976). The Miwok divided all nature into two moieties, Water and Land. Each moiety had a series of animals, plants, or other objects associated with it. In infancy a person received the name of an animal or object from the moiety to which he was born. This object or animal became that individual's totem. Bears, coyotes, and deer were all common totemic animals for the Miwok, Yokuts, and Cahuilla societies. The capture and keeping as a pet of one's totem was common among the Miwok and Yokuts (Kroeber 1925; Driver 1937; Aginsky 1943). The killing and burial of a totemic animal in the same grave with its deceased owner was practiced by the Miwok, Yokuts, and Nisenan. Thus, unusual animal/human burial associations in societies with totemic descent groups could be the combined result of the keeping of one's totem as a pet and the killing and interment of this pet at the death of its owner. This may be a plausible explanation of an unusual burial of a child and a bear in a site along the Sacramento River delta (Cowan et al. 1976). Possession of one's totem or part of one's totem brought with it some of the supernatural powers which were believed to be inherent in the totemic animal. Thus, it is possible that one's totemic animal would be buried with an individual at their death to re-establish their living relationship and thus aid them in their afterlife.

The social and religious structure of Chumash and Gabrielino societies is poorly understood. While there is evidence that the Chumash possessed totemic clans (Johnson 1988a), these clans were probably not divided into a strict moiety system like that present in the Miwok and Yokuts cultures. Some Yokuts, Gabrielino, Kitanemuk, Chumash, and Juaneño are thought to have had pseudo-moieties that functioned in social and ritual activities (Bean 1976). The Chumash did have cults or sodality organizations that were homologous to Gabrielino and Luiseño Chingichngish religious–ceremonial organizations. "Members of this cult were referred to as *'antap* and their primary responsibility seems to have been the performance of dances and other rituals at large public ceremonies. Members were baptized into the cult as children, and through a period of apprenticeship learned the esoteric language, sacred songs and dances and other aspects of ritual that characterized it" (Blackburn 1974:104–105). Large *fiestas,* which transcended ethnic, political, and linguistic boundaries, were sponsored by members of *'antap-yivar* cults (Hudson and Blackburn 1978). The Chumash Fox Dance was usually performed at such large gatherings (Hudson and Blackburn 1985). It is possible that those who performed this dance actually belonged to an *'antap*-like "fox cult" or were members of an Island Chumash Fox Clan. Island foxes could have been revered and kept as pets by members of this fox cult or clan. Upon the death of one of the cult members, special burial considerations may have included the interment of an entire or partial island fox with the dead cult member. This could account for the island fox/human burials recorded on the Northern Channel Islands.

Among tribes in South Central California, including the Chumash and the Gabrielino, individuals made contact with the supernatural by means of a spirit guide, or dream helper. The following discussion comes from Applegate's (1978) synthesis of data on the "dream helper" among southern California Indians. "The supernatural manifests itself in the form of a spirit which appears in a dream or an induced vision—the dream helper. The dream helper speaks to the dreamer, offering him or her power and protection, and gives a talisman and a song—perhaps with instruction in their use—which symbolize the helper and through which it can be evoked. The dreamer takes care to respect and obey his helper; in time of need he can call upon the dream helper and be confident of its support" (Applegate 1978:7). Dream helpers were generally animal spirits, but could also be ghosts or personified natural forces. Dream helpers could come unsought, or could be acquired either through the use of drugs or through techniques such as fasting or night bathing. The Yokuts, Western Mono, and Chumash were the only tribes known to have had foxes as dream helpers. This is not unexpected since larger, more important, and more dangerous animals (i.e., eagle, bear, mountain lion, rattlesnake) are most often mentioned as being dream helpers. However, "less consequential creatures like Fox, Blackbird, Frog, or Lizard" were probably also used as dream helpers by tribes in South Central California (Applegate 1978:20). The only ethnographic evidence to suggest that the Chumash might have had foxes as dream helpers is a statement that one Chumash *'antap* leader had fox as a dream helper (Hudson and Blackburn 1978). Given the abundance and prominence of island foxes on the Channel Islands it is possible that they served as dream helpers for the Island Chumash.

Animal helpers acquired by an individual were distinct from an inherited totemic animal. "The totem is a social concept, a matter of public knowledge and individuals are free to speak of their totem and to ask strangers of theirs. The totem is inherited patrilineally, imposing certain political, ceremonial, or professional obligations on the individual and giving him in turn certain rights . . . Altogether the dream helper relationship is much more personal and much less formalized than the totemic relationship" (Applegate 1978:23). One did not have to belong to a particular animal totemic lineage in order to have the same animal as a dream helper. The similarity between the two concepts is in the veneration afforded the totem and the dream helper. An individual would not kill or eat the flesh of his totem or his dream helper.

An essential part of the dream helper complex is the talisman or *atishwin* as it was called by the Chumash. "The talisman is the physical representation of the helper; it not only symbolizes the relationship of an individual to his dream helper, it is an actual channel of power" (Applegate 1978:53). The talisman can be made of an unusual material object such as a quartz crystal or can be animal parts from one's dream helper. Possession of a talisman was " . . . believed to confer supernatural power on its owner by linking that individual with a tutelary [=dream helper]" (Hudson and Blackburn 1986:139). Among the Yokuts and Western Mono arrow quivers made of fox skin were considered talismans (Gayton and Newman 1940). Possession of a portion of one's dream helper (i.e., a talisman) brought with it some of the special limited supernatural powers possessed by that dream helper. Among the Chumash it is not known whether the animal counterpart of one's dream helper was revered and kept as a pet or whether their body parts (i.e., fur, claws, skull, teeth) were kept as talismans. The Chumash believed that when a talisman was magically obtained it was useless except to its owner and was generally buried with him (Applegate 1978). Perhaps an individual was buried with his talisman in order to help him in the journey to the Land of the Dead. Given the abundance of island foxes on the Channel Islands it is not inconceivable that foxes were a common dream helper for the Island Chumash. This provides a plausible explanation for the occurrence on the Northern Channel Islands of island fox remains in direct association with human burials and may help to explain a number of the island fox burials which appear to have ceremonial connotations.

CONCLUSIONS

Information from the archaeological record and from ethnographic and ethnohistoric literature was used to shed light upon interactions between Native Americans and island foxes. Based on this data review, tentative answers can be given to some of the questions asked at the beginning of this paper.

Islands off the coast of southern California have been inhabited by humans for at least the last 9000–10,000 years. In prehistoric times, the Northern and Southern Channel Islands were inhabited by tribes belonging to a single, widely distributed population of Hokan speakers. In more recent times these two island groups were inhabited by tribes belonging to separate language families (i.e.,

Hokan speakers on the Northern Channel Islands and Uto–Aztecan speakers on the Southern Channel Islands). The occurrence of island-manufactured shell bead money and quarried steatite in mainland and island sites firmly establishes the existence of trade both among the islands and between the islands and the mainland. The existence of active trade between the Northern and Southern Channel Islands during prehistoric times provides a mechanism and route by which people could transport island foxes between these two island groups.

In terms of subsistence activities, groups on the Channel Islands harvested island foxes for their pelts which were used to make arrow quivers, capes, blankets, and ceremonial fox dance headdresses. Although island foxes may have occasionally been eaten, they were not an important staple in the diet of Native Americans and therefore were probably not transported or traded to the southern islands to serve as an alternative source of food.

Island foxes did play an important role in religious and ceremonial practices of tribes on the Channel Islands. Archaeological and ethnographic manifestations of this interaction pattern included intentional burials of island foxes, appearance of foxes in Chumash legends, and fabrication of articles from their hides for use in the Island Chumash Fox Dance. Direct human–fox burial associations found on the Northern Channel Islands are probably an indication that an individual had island fox as a totem or dream helper, or that the person belonged to a social group or clan responsible for performing the Island Chumash Fox Dance. The ritual burial of foxes on San Clemente Island suggests the existence of a canid killing ceremony possibly associated with Chingichngish religious practices (e.g., toloache rituals) or with mourning ceremonies (Salls and Hale 1991). Although none of these ritual associations can be adequately substantiated from the ethnographic or ethnohistoric literature, they can be suggested as plausible explanations from what is known regarding Chumash and Gabrielino social structures and religious beliefs.

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